

cation which he can hardly have had in mind: "It is only if a departure from average occurred of an order of magnitude completely isolated from all other departures that the 'abnormality' would be truly abnormal and worthy of special investigation." [Italics mine.—B. M. V.] There have been occasional references of late, particularly in British meteorological publications, to the great desirability of including the dissection of individual depressions in our research into the structure of cyclones—of going into what some one has called micrometeorology. Few will disagree with this view. The consequences to meteorology would be serious indeed, were it generally maintained that departures from normal are unworthy of special investigation because they never exceed a certain order of magnitude and are never produced by unusual causes. It may be suggested that those cyclones which have brought about rare abnormalities are perhaps most worthy of special investigation, for the reason that they are striking examples of a type.—B. M. Varney.

THE LONDON FOG OF JANUARY 10-11, 1925

[Abstracted from Meteorological Magazine, February, 1925, pp. 7-9]

The heavy fog on the above date followed a month after the great fog of December, 1924. Mr. L. C. W. Bonacina, having made a very thorough series of observations in various parts of London on the occasion of the January fog, notes that two distinct types of "fog" occurred simultaneously, though singly or together according to locality. In the densely built-up streets of central London "the fog took the form of a dark, pungent, unsaturated haze, leaving pavements and clothes perfectly dry and causing little hindrance to traffic, the visibility being at least 50 yards." But in all open spaces, such as parks, squares, etc., the fog took the "form of great rolling blankets, very wetting and impenetrable to vision and completely paralyzing traffic."

The point is emphasized that a clearer distinction ought to be made between those fogs which should be regarded as smoke haze and the fog which is a combination of smoke haze and water droplets. It is the latter type which makes the serious trouble. The inference is drawn that if the smoke factor could be eliminated inner London would experience far less fog than suburban London and the more open country round about, where radiation fog so readily results from nocturnal radiation.

Discussing Mr. Bonacina's note, Mr. F. J. W. Whipple points out that the existence of the purely smoke haze in the densely built-up area may have been the result of the evaporation of water-fog particles on account of the warmth of pavements, air from buildings, etc. Great fogs attain a thickness of some 500 feet over London. Radiation cooling at the upper surface of the fog is believed to be intense enough to set up a convectional circulation between this upper surface and the ground and consequently to result in the constant bringing down of smoke particles, thus keeping the smoke haze black in the streets.

[It would be of interest to have comparative observations on the nature of the fog at street level in central London and on the highest buildings or towers in the same locality at the same time. Such observations might well show that above the smoke haze of the streets distance from sources of warmth permits the existence of the combination smoke haze and water fog of the same nature as that which is found at ground level in the parks and squares.]—B. M. V.

MEASUREMENT OF UPPER-WIND VELOCITIES BY OBSERVATIONS OF ARTIFICIAL CLOUDS

By C. D. STEWART

[Abstract accompanying B. M. O. Professional Notes, vol. 33, No. 38]

This paper gives the theory and practical details of the method of obtaining upper wind velocities from observations of clouds in a mirror. The apparent path of a cloud is traced on the surface of a Hill mirror, and from the length of the trace on the mirror the wind velocity at the height of the cloud is computed by simple multiplication by the use of a table of factors given in the text. The method was first used with shell bursts during the war, but the paper describes how it has been extended to include observations of clouds discharged from airplanes. Tables are given to enable the pilot to correct his height to the necessary degree for any readings of his altimeter and thermometer. The method is extremely simple in use.

WARM AND COLD WINTERS IN SIBERIA AND THEIR DEPENDENCE ON THE CONDITION OF THE GULF STREAM¹

W. B. Schostakowitch, in Meteorologische Zeitschrift for January, 1925, presents a résumé of his studies on the above subject, including tables which recapitulate the most important results and statements of his conclusions as to the various relations between the Gulf stream and Siberian winter temperatures. The work was based on the records of 13 stations, and December, January, and February were taken as the winter months.

In 16 out of 22 winters temperature departures had the same sign throughout Siberia except along the borders. In one winter plus and minus departures were variously distributed; in two winters, eastern and western Siberia showed opposite departures; in three winters, central Siberia showed departures of the same sign throughout the area but opposite to the departures in the west.

Thirty years of record at Irkutsk show the anomalies of pressure and temperature to have had opposite signs in 73 per cent of the cases. In the average, negative pressure anomaly of 1 mm. coincided with a positive temperature anomaly of 0.98° C.; a positive pressure departure of 1 mm. coincided with a negative temperature departure of 1.1° C. A correlation coefficient of -0.646 with a probable error of -0.072 was found for the pressure-temperature relation.

Underdevelopment of the Siberian anticyclone, rather than displacement of it, is found to be characteristic of the winters with plus temperature anomaly, whereas in the cold winters the whole of Asiatic Russia is overlaid by abnormally high atmospheric pressure. The typical warm-winter pressure distribution favors invasion of central Siberia by cyclones from northwestern Europe,

¹ The following comment, questioning the appropriateness of the name "Gulf Stream," especially as applied to the waters adjacent to the northwest coast of Europe, is made by Mr. J. N. Nielson, of the Meteorological Institute of Copenhagen, in a note on the hydrography of the Dana Expedition (1921-22 in the Atlantic Ocean) printed in *Nature* for April 11, 1925, pp. 529-530. Mr. Nielsen's observation is of particular interest because it divides what is generally called in this country the North Atlantic drift into two parts with radically different characteristics. "In the waters south of Newfoundland the Florida current meets the Labrador current, giving rise to a mixed product with somewhat lower temperature and salinity than are found in the continuation of the Antille current, which runs on the right side of the Florida current and consists of water masses which keep outside the islands of the Antilles."

"The mixed product arising from the Labrador and Florida currents fills the considerable area of sea south of Iceland, while the warm and salt water washing the coasts of northwest Europe is undoubtedly mainly derived from the Antille current. The term 'Gulf Stream', generally employed in European parlance to denote the warm current in the northeastern part of the Atlantic, must therefore be regarded as inappropriate, since it can only rightly apply to the current off the east coast of the United States, and even this would be better designated by the older name of 'Florida current,' as the current in question does not originate in the Gulf of Mexico, but comes from the equatorial region, and covers only the shortest possible distance in the Gulf of Mexico."

each cyclone being attended by a notable rise in temperature.

A closed cycle of changes in the distribution and sign of departures in air temperature, pressure, wind velocity, ocean current velocity, and coincident changes in the temperature of the Gulf stream and in air temperatures over northwestern Europe operates to maintain the *status quo* of one type of regime until some fundamental dynamical change brings a shift to another type.

The author cites three general conclusions of Meinardus relative to the effects of changes in the circulation in the northern North Atlantic Ocean, as follows:

At times of strengthened atmospheric circulation over that area, there result (a) a higher temperature of the Gulf stream [North Atlantic drift] along the European coast, (b) an amount of ice above normal on the Iceland coast, and (c) an amount of ice above normal on the Newfoundland coast, the Denmark-Iceland pressure gradient being used as an index to the atmospheric circulation. At times of weakened atmospheric circulation the reverse of these results is found.

The most striking relations of these and other conditions, to winter temperature in Siberia, are summarized as follows:

(1) Based on Petterson's determinations of conspicuous temperature departures of the Gulf stream along the coast of Norway:

Gulf stream warmer than normal		Gulf stream colder than normal	
Winter temperature anomaly in Siberia:	° C.	Winter temperature anomaly in Siberia:	° C.
1873-74.....	3.5	1874-75.....	-1.4
1881-82.....	3.2	1876-77.....	-2.0
1883-84.....	3.2	1878-79.....	-1.7
1886-87.....	2.1	1890-91.....	-0.7

(2) Sixty-five per cent of all cases of excess (*or deficient*) summer ice near Iceland (a result of increased atmospheric circulation) showed a plus (*or minus*) temperature anomaly during the ensuing winter in Siberia.

(3) Seventy-five per cent of all cases of overnormal (*or subnormal*) pressure gradient between Denmark and Iceland coincided with a plus (*or minus*) winter temperature anomaly in Siberia. A 5 mm. increase of the gradient above normal for September-January corresponded with 1° C. plus anomaly; and a 3.6 mm. decrease below normal, with a 1° C. minus anomaly, for the Siberian winter.

(4) Eighty-five per cent of all cases of increase (*or decrease*) of the atmospheric circulation between the Azores and Iceland showed a plus (*or minus*) temperature anomaly.

(5) Seventy per cent of all cases of the Barents Sea summer ice limit, being farther south (*or north*) than usual, showed a minus (*or plus*) temperature anomaly. Decrease of 48' in latitude corresponded to a lowering of

the winter temperature in Siberia of about 0.5° C. and an increase of 1° C. to a raising of the temperature about 0.7° C.

(6) In 67 per cent of all cases an increase (*or decrease*) in the area of the ice-covered region corresponded with a minus (*or plus*) temperature anomaly, a warming of 0.5° taking place for each 280,000 km.² of decrease in ice area and a cooling of 0.4° for each increase of 321,000 km.²

(7) In 90 per cent of all cases a positive (*or negative*) temperature departure for November-February in the surface water of the Norwegian Sea corresponded to a positive (*or negative*) winter temperature anomaly in Siberia. An increase of surface water temperature of 0.5° corresponded to an increase of 1.5° in temperature in Siberia and a decrease of 0.5° to a decrease of 0.9°.

(8) In 76 per cent of all cases years of excess ice about Newfoundland coincided with warm winters in Siberia and years of deficient ice with cold winters.

The general conclusion is reached that anomalies in the hydrometeorological conditions of the Gulf Stream region show sufficient persistence to enable one to make practical use of them in forecasting the general nature of the winter in Siberia.—B. M. V.

ICE IN THE ARCTIC SEAS IN 1924

[Reprinted from Nature, London, April 25, 1925]

The annual report of the Danish Meteorological Institute is fuller than usual, especially as regards the Kara and Barents Seas and the east coast of Greenland, but, owing to lack of information, is very meager concerning the Beaufort Sea and coasts of eastern Siberia. In European Arctic regions the year on the whole was marked by less ice than is the rule during the spring and summer. In August and September the Kara Sea was exceptionally free from ice. The White Sea was clear in June and in the autumn froze much later than usual. In the northeastern part of the Barents Sea there was more open water than usual; in August, the only month for which there are data, it came very near to Franz Josef Land. During April and May very heavy pack extended to the southwest of Spitzbergen so far south as Bear Island, but the northern part of the west coast, as usual, was clear. In June conditions changed completely, resulting in a summer with exceptionally little ice in Spitzbergen waters. A Norwegian sloop circumnavigated North-East Land during August. On the east coast of Greenland the few observations suggest a narrower belt of close pack ice than usual. Iceland was touched by pack ice only during February. The Newfoundland Banks had little ice and few icebergs, and Davis Strait was fairly clear. The report is illustrated with several maps.